WHAT IS CLAIMED IS:

1. An optical coating for a substrate, comprising:

a first anti-reflection layer of a dielectric;

a first metallic layer over the first anti-reflection layer; and

a second anti-reflection layer of a dielectric over the first metallic layer;

wherein at least one of the first anti-reflection layer and the second anti-reflection layer comprises an amorphous material, the amorphous material comprising titanium oxide and an additive, wherein the additive in an oxidized state does not form a solid solution with the titanium oxide.

2. The optical coating according to claim 1, wherein the additive is selected from a group consisting of silicon, aluminum, bismuth, gadolinium, tantalum, zinc, and any combination thereof.

3. The optical coating according to claim 1, wherein the first metallic layer comprises silver.

4. The optical coating according to claim 1, further comprising a barrier layer between the first anti-reflection layer and the first metallic layer.

5. The optical coating according to claim 1, further comprising a barrier layer between the first metallic layer and the second anti-reflection layer.

6. The optical coating according to claim 4 or 5, wherein the barrier layer comprises a material selected from a group consisting of titanium, nickel-chromium, aluminum, and zinc.

7. An optical coating for a substrate, comprising:

a first anti-reflection layer of a dielectric;

a first metallic layer over the first anti-reflection layer;

a second anti-reflection layer of a dielectric over the first metallic layer;

a second metallic layer over the second anti-reflection layer; and

a third anti-reflection layer of a dielectric over the second metallic layer;

wherein at least one of the first anti-reflection layer, the second anti-reflection layer, and the third anti-reflection layer comprises an amorphous material, the amorphous material comprising titanium oxide and an additive, wherein the additive in an oxidized state does not form a solid solution with the titanium oxide.

8. The optical coating according to claim 7, wherein the additive is selected from a group consisting of silicon, aluminum, bismuth, gadolinium, tantalum, zinc, and any combination thereof.

9. The optical coating according to claim 7, wherein the second metallic layer comprises silver.

10. The optical coating according to claim 7, further comprising a barrier layer between the second anti-reflection layer and the second metallic layer.

11. The optical coating according to claim 7, further comprising a barrier layer between the second metallic layer and the third anti-reflection layer.

12. The optical coating according to claim 10 or 11, wherein the barrier layer comprises a material selected from a group consisting of titanium, nickel-chromium, aluminum, and zinc.

13. An optical coating for a substrate, comprising:

a first high-refractive index layer;

a first low-refractive index layer over the first high-refractive index layer;

a second high-refractive index layer over the first-low refractive index layer; and

a second low-refractive index layer over the second-high refractive index layer;

wherein at least one of the first high-refractive index layer and the second high-refractive index layer comprises an amorphous material, the amorphous material comprising titanium oxide and an additive, wherein the additive in an oxidized state does not form a solid solution with the titanium oxide.

14. The optical coating according to claim 13, wherein the additive is selected from a group consisting of silicon, aluminum, bismuth, gadolinium, tantalum, zinc, and any combination thereof.

15. The optical coating according to claim 14, wherein at least one of the first low refractive index layer and the second low-refractive index layer comprises a material selected from a group consisting of silicon dioxide and silver.

16. A method of coating a substrate, comprising:

depositing a first anti-reflection layer of a dielectric over a substrate;

depositing a metallic layer over the first anti-reflection layer; and

depositing a second anti-reflection layer of a dielectric over the metallic layer;

wherein at least one of the first anti-reflection layer and the second anti-reflection layer comprises an amorphous material, the amorphous material comprising titanium oxide and an additive, wherein the additive in an oxidized state does not form a solid solution with the titanium oxide.

17. The method of claim 16, further comprising heating the coated substrate to a temperature higher than a heat-treatment temperature of the substrate after said depositing of the first anti-reflection layer, the metallic layer, and the second anti-reflection layer.

18. The method of claim 16, wherein at least one of the depositing a first anti-reflection layer, the depositing a metallic layer, and the depositing a second anti-reflection layer comprises sputtering.

19. The method of claim 18, wherein at least one of the depositing a first anti-reflection layer and the depositing a second anti-reflection layer comprises sputtering, in an oxygen environment, a target comprising titanium and the additive.

Sub AS enc

20. The method of claim 18, wherein at least one of the depositing a first anti-reflection layer and the depositing a second anti-reflection layer comprises sputtering, in an oxygen environment, a first target comprising titanium and a second target comprising the additive.

21. The method of claim 16, wherein the additive is selected from a group consisting of silicon, aluminum, bismuth, gadolinium, tantalum, zinc, and any combination thereof.